

NEMATODE PROBLEMS ON BANANAS AND PLANTAINS IN FLORIDA

R. McSorley¹

Introduction: Bananas and plantains (*Musa* spp.) are popular ornamental and fruit crops grown in home gardens in many parts of Florida. Commercial production of several cultivars is established in Dade County, and has been increasing in recent years. Unfortunately, however, bananas and plantains are highly susceptible to damage caused by plant-parasitic nematodes and soilborne plant pathogens. Since distinction between bananas and plantains is difficult and since nematode problems on both hosts are similar, it is convenient to discuss their nematode parasites and management together.

Nematodes: The burrowing nematode, *Radopholus similis* (Cobb) Thorne, is the most serious nematode pest of bananas and plantains throughout the Tropics (1,2,8,11). In Florida, it occurs occasionally on bananas from Alachua County southward throughout the state (4,5), but fortunately, it is not common in the areas of commercial production in Dade County (5,7). However, the spiral nematode, *Helicotylenchus multicinctus* (Cobb) Golden, is very common and damaging in commercial banana plantations in Dade County (5,6,7), and occurs on this host throughout the state. Root-knot nematodes, especially *Meloidogyne incognita* (Kofoed and White) Chitwood, are often found on banana roots, but are not considered very damaging when compared with *R. similis* and *H. multicinctus*. High populations of the reniform nematode, *Rotylenchulus reniformis* Linford and Oliveira, are occasionally found associated with this host in Dade County (5). Its effect on the plant has not yet been established.

Symptoms: *Radopholus similis* causes severe lesions and loss of feeder roots. Longitudinal section of the larger roots will reveal reddish internal lesions as well. In addition, *R. similis* may invade the rhizome, or corm, causing lesions and damage. *Helicotylenchus multicinctus* is confined to roots and does not damage other below-ground plant parts. High populations of *H. multicinctus* can cause severe root damage (Fig. 1). Small feeder roots may be destroyed, and those remaining may appear necrotic and fall off when the roots are handled. Larger roots show small black surface lesions and larger necrotic areas (Fig. 1). When roots are cut longitudinally, most of the damage will be confined to the outer surface of the root (11,12), with little internal damage evident unless severe necrosis and decay has begun. Severe root damage by either *H. multicinctus* or *R. similis* can result in toppling of mature plants (Fig. 2), particularly during high winds or when a heavy bunch is produced. In Dade County, the life of a plantation infested with *H. multicinctus* can be less than three years (7), and the nematode is known to damage all three cultivars commercially grown there,--'Burro' (ABB group), 'Apple' (AAB group), and 'Macho' (AAB group). Galls from root-knot nematodes are often not obvious on

¹Associate Nematologist, Dept. of Entomology and Nematology, IFAS, University of Florida, Gainesville, FL 32611

this host. They occur sporadically in many banana plantations, but are not a major concern.

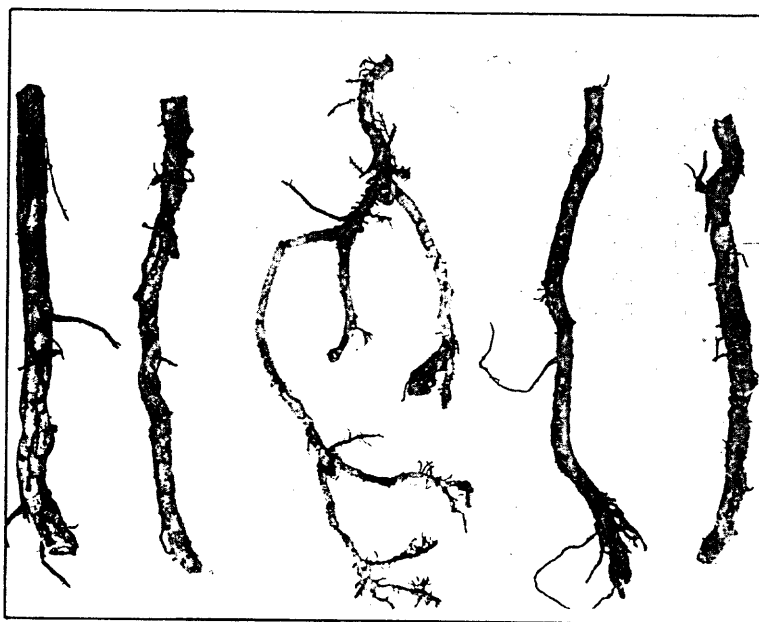


Fig. 1. Damage to banana roots by *Helicotylenchus multicinctus*.



Fig. 2. Decline and toppling of banana plants in Florida as a result of high *Helicotylenchus multicinctus* populations.

Management: Application of nematicides to reduce populations of *R. similis* or *H. multicinctus* in established plantings of bananas is not an available management option in Florida. Although nematicides are widely used in the tropics to manage nematodes on bananas, most are not registered by the U. S. Environmental Protection Agency for this use in the continental United States, where bananas are considered a minor crop. Ethoprop is the only nematicide currently registered for use on bananas in Florida, but attempts to manage *H. multicinctus* populations with this material were unsuccessful (6).

Since *H. multicinctus* and *R. similis* are so difficult to control in established plantings of bananas, the most effective methods of managing them in Florida may be to avoid and prevent new infestations. Preplant soil sampling is essential to detect these nematodes in potential planting sites. Fortunately, most potential planting sites in Florida are probably free of *H. multicinctus* and *R. similis*, unless bananas or other hosts infested by these pests had grown there previously. Although *H. multicinctus* has a wide host range (9), it has been reported in Florida mainly on bananas and plantains (5,7), and in one case on mango (9).

The principal means of spreading *H. multicinctus* is on infested planting pieces (7,10), and this may account for the frequency of heavy infestations in banana plantations in Dade County, where the nematode is otherwise very rare. Because *H. multicinctus* persists in root stubble and soil attached to banana planting pieces (7), introduction of this pest to new sites can be prevented by paring any remaining root material from the planting piece (7), followed by a washing with a hard spray from a water hose to eliminate any adhering soil. If *R. similis* is present, more severe paring is needed to remove any reddish lesions and sources of infection from the planting piece itself (11). Immersion of planting pieces in a hot water bath at 55 degrees C (131 degrees F) for 25 minutes has been used to control *R. similis* (1,2,3). Since *H. multicinctus* is found only in the attached root stubble and not in the planting piece itself, maintaining a temperature of 50 degrees C (122 degrees F) for 10 minutes may be sufficient to control *H. multicinctus* on planting pieces without adverse effects on emergence of leaves and subsequent growth (7).

Use of treated (pared or hot water immersed) planting material in uninfested sites can minimize future damage and decline from *H. multicinctus* or *R. similis* and greatly extend the life of banana and plantain plantings in Florida.

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